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With Compliments of the Author.

The Removal, by Trephine, of
Fluid as the Result of
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of a Case.

—BY—

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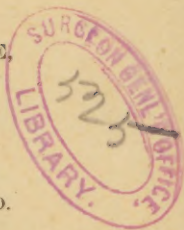
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While the cranial vault has been the seat of many recent and most wonderful surgical exploits, there does not seem to have been any progress made in draining the arachnoid cavity of fluid as the result of any cause. If so, it has not been my good fortune to see any statement whatever as to the results.

Believing that any abnormal quantity or quality of fluid wherever found should be immediately removed, and having for several years advocated such a procedure, I at last, through the courtesy of Dr. B. F. Beebe, had the opportunity of operating for cerebral pressure in a case of acute cerebral meningitis.

Being unable to find any literature upon the subject, makes it necessary for me to confine myself principally to personal experience. However, a few quotations and remarks will, I believe, be apropos: Cerebral meningitis is both primary and secondary, the primary being principally due to trauma, while the secondary follows some local or general infectious disease, such as:



1. Tuberculosis.
2. Scarlet fever.
3. Diphtheria.
4. Typhoid fever.
5. Pneumonia.
6. La Grippe.
7. Measles.
8. Whooping cough.

The amount of exudation bears no constant relation to the severity of the symptoms.

Whether the disease be primary or secondary, I maintain that the fluid should be removed just as soon as pressure symptoms manifest themselves. This, of course, can only be done by means of opening the skull and incising the membranes and allowing free drainage, which can only be accomplished by entering the arachnoid cavity over both parietes and cerebellum to either side of the median line.

The questions here arise as to the continuity of the arachnoid—as to whether or not the arachnoid sac is a closed sac.

No person, perhaps, has done more toward settling this much-mooted question than Dr. F. W. Langdon, of Cincinnati. (Medical Record, August 15, 1891, p. 177.)

I herewith append his conclusions:

First. "The arachnoid membrane is a true shut sac, similar in structure and function to the serous membranes of the other great cavities. Its parietal layer is easily separable from the dura

at the vertex in the fetus and young infant, but practically inseparable in this region in the adult. At the base of the skull it is demonstrable as a separate membrane, even in the adult. To assert that the parietal layer of the arachnoid is absent, because its subepithelial connective tissue has fused at the vertex with the dura (connective tissue) is as incorrect as to describe the great omentum as one layer of peritoneum, because its original four layers have become matted and adherent.

Second. The arachnoid cavity communicates freely with the sub-arachnoid space by means of two foramina, situated in the visceral arachnoid, one on either side of the medulla. For these I would propose the name "Lunulate Foramina," from their crescentic or lunulated edges, produced by the attachments of fibrous bands, which cross the openings transversely.

Subsequent observations in two instances confirm the presence of the "lunulate foramen." In one of these the basilar process of the occipital and the sphenoid body were cut away from the base and the dura removed, so as to show the foramina in situ, thus excluding the possibility of their artificial production during the extraction of the brain."

The arachnoid space therefore in the anterior, middle and posterior fosse may possibly be drained from one common opening. This I hardly think probable,

as the channel or channels connecting the various arachnoid chambers are in all probability obliterated by the pressure of the abnormal amount of fluid.

In consequence of their collapse it would be necessary to make an opening into the various fossae.

The ventricles could be emptied by aspiration through the cerebri. This could be done as often as is found necessary. I believe that the walls of the ventricles suffer alike with the walls of the arachnoid cavity. However, it is not definitely known as to whether or not they are always associated. The settlement of this question will no doubt have much to do with the course of treatment.

If an abnormal amount of fluid in the arachnoid cavity, as the result of acute cerebral meningitis, is always associated with an abnormal amount of fluid in the ventricles the treatment will be more complicated than when the arachnoid cavity alone is involved. Pressure from any cause, be it solid or fluid matter, will seriously influence the lymphatic system and assimilation of any character.

On July 15 I was called by Dr. Beebe to see a white male child 18 months old convalescing from pertusis. The doctor's first visit was on July 7, although the child had been very much indisposed for two or three days previous. Pulse somewhat rapid, temperature two or three degrees above normal, bowels regular and the urine passed at regular in-

tervals. The pupils were very much contracted, and did not respond to light.

The ordinary remedies for acute cerebral meningitis were given, but the condition rapidly became worse; coma became profound, with inability to take food or move the extremities.

There was at the time of my visit (July 15) retention of urine and small movements from bowels. The respirations were both shallow and rapid, face livid, skin dry, sallow and warm.

There was left facial paresis, indicating that the pressure was the greatest upon the right side; also of the muscles of deglutition, accompanied by a gurgling sound.

Solid or liquid matter of any character had not passed the fauces for twenty hours.

Emaciation was extensive and the discharges from the bowels watery.

In the presence of Drs. B. F. and William Beebe, Edwin and Joseph Ricketts, my students Wallingford and Laughlin, I proceeded to first perforate the right parietal one inch from the median line and as far from the lambdoidal suture. An antero-posterior incision was made two inches in length through the integument and periosteum. These membranes were held with retractors, while the bone was penetrated with a chisel, making an olive-shaped opening.

The dura immediately bulged forth in

the opening, thus indicating great pressure from within. This membrane had a dark, congested appearance, and where incised gave off a dark, bloody serous discharge. There was no fluid extradural, nor did any escape or seem to be present sub-dural.

However, the moment the arachnoid cavity was opened a clear, straw-colored fluid escaped in large quantities and continued to flow.

Within five minutes the facial paralysis had disappeared, the left leg was drawn up and the left arm thrown across the chest.

The pupil upon the left became dilated and the general condition of the child improved.

I then hastily made a similar opening upon the left side at the corresponding point, in the same manner, both having been made without an anesthetic, the general sensibility being so benumbed.

Fluid of the same character flowed in a similar manner upon opening the arachnoid cavity.

Fifteen minutes had not intervened from the beginning of the first to the ending of the second operation.

At the end of this time the child cried aloud, could move its extremities to any position, moved its head to either side, the gurgling noise in its throat ceased and milk, water and whisky were swallowed with apparent relish.

Artificial heat was applied and warm drinks given, an exceedingly light pre-

pulse was removed and the glands bared.

A large quantity of urine was voided and the general condition of the child entirely changed for the better. It continued to take a sufficient quantity of food and the pulse became less frequent and with a better volume.

The respirations became thirty, where they had been as high as fifty per minute.

The body was cleansed with warm water and protected with wool.

The fluid continued to flow from either opening into the arachnoid cavity. Its quality continued the same, while the quantity became diminished.

The scalp and periosteum were drawn together with silk worm gut, leaving a small opening at the lowest point for drainage. A 50 per cent. solution of peroxide of hydrogen was used to irrigate the wound and as much of the cavity as could be reached.

At 2 P. M. patient's condition much improved; temperature 102.

2.30 P. M. temperature began to rise.

4 P. M. temperature 106.

Frequent baths were given. -

5 P. M. temperature 104.

7 P. M. temperature 104 3-5.

Pulse feeble.

Whisky subcutaneously; also nitrate strychn. gr. 1-40 and nitro-glycerine gr. 1-100. Legs and arms were drawn up at this time, showing sensibility and the power to move extremities.

Evacuation of bowels and bladder.

Condition improved very much.

Pulse and respiration improved and less frequent.

10 P. M. child vomited.

Whisky by rectum.

Nitrate strychn. gr. $\frac{1}{4}$ subcutaneously.

Vomited several times.

Lime water given and vomiting ceased.

Digitalis M. 3 at 6 A. M.

July 10 vomited soon after 9 A. M. A tight and adherent prepuce was removed and urine at once voided to the amount of about 16 ounces.

Temperature fell from 104 to 103 $\frac{1}{4}$.

11 A. M. vomited. Temperature 105 2-5.

1 P. M. continued to vomit occasionally.

Twitching left side. This continued until 4.25 P. M., when dissolution took place. Twenty-eight hours after the operation the flow of fluid was not regular, but continued from the time of operation until death ensued.

I think that the operation should be made in these cases as soon as pressure symptoms manifest themselves.

As it is, nearly all of these cases die without an operation.

The question now is: Will any of them be benefited or cured if operated upon during any particular time in the course of the disease?

